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MOLLITIES OSSIIUM

IN

INSANITY.

BY

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MOLLITIES OSSIUM IN INSANITY.

THE occurrence of mollities ossium, malacosteon, or osteomalacia in asylums seems to be rare, although several cases are mentioned in connexion with more or less evident mental disease. Mr Solly¹ gives the case of C. S., æt. 29, a young woman whose health declined after an attack of scarlet fever at the age of 19. "Two years afterwards, from a slight cause, the clavicle was fractured, and never again united. After another accident of a more trivial nature, she became nervous and desponding, and her friends remarked a great difference in her manner; her disposition seemed changed from an open and amiable temper to one of restlessness and suspicion. They became fearful that she was going out of her mind. After exposure to damp, she had an attack of acute rheumatism. She complained of great pain over the posterior part of the head, and was occasionally violently delirious. At the approach of convalescence, mania set in, and during its existence she attempted to commit suicide." Mr Solly connects the state of the cranial bones, which were found extensively diseased, with the mental affection, and contrasts the case with that of another patient mentioned in the same paper, in whom absence of the disease from the bones of the skull co-existed with entire mental faculties. Curling's² patient, æt. 72, had been subject to hysterical fits before admission into the hospital. In Litzmann's³ "Contributions," six cases are enumerated (4 women and 2 men) where "the disease evidently became developed in consequence of profound lesions of the central organs of the nervous system. One of the patients had suffered for years from insanity, another from chronic hydrocephalus, which was produced by a fall on the head at two years of age; the other 4 were of weak intellects, and of these 2 had continued convulsions

¹ Med.-Chirurg. Trans., 1844.

² Med.-Chirurg. Trans., 1836.

³ Translated by Dr M. Duncan, pp. 28 and 29.

in early childhood." In the same paper another well-marked case is mentioned of a woman, aged 22, "who became ill in consequence of a profound affection of the mind, and died nine months afterwards; the bones only of the lower extremities and of the pelvis were affected."

Within the short interval of about six months, two examples of the disease occurred in the Perth Asylum, in the case of two women, both of whom had been for a long time resident in the establishment; my attention was accordingly directed to the subject, mainly with a view to discover whether the peculiar circumstances connected with asylum life have not a tendency to engender this disease, or whether the morbid condition may not simply be dependent upon the generally diseased condition of the system. Moreover, there is at present under treatment a male patient, formerly a weaver, who has a distinct double curvature of the spinal column, antero-posterior and to the left, most marked in the middle dorsal region, and who constantly complains of great pains in the bones of his legs, and lately had his ribs fractured from a slight fall; all which symptoms, taken in connexion with his general appearance and the duration of his malady, point somewhat in the same direction. He has a peculiar crouching gait, and often walks in a limping fashion, averring that his leg is broken. His urine is somewhat pale; sp. gr. 1015; phosphates are scanty; there are a few crystals of uric acid; no albumen; no sugar. His blood presents a healthy aspect, coagulates firmly, and microscopically shows a normal relation of white to red corpuscles, which are natural in appearance. He is subject to repeatedly recurring attacks of corneitis and conjunctivitis.

The two cases, which I shall shortly narrate, presented certain features of similarity in their earlier symptoms. Both occurred in females past the middle period of life, each of whom had been the subject at one time of suicidal melancholia, the disease, in fact, retaining certain of its characteristics to the last. One, the eldest, however, had partly lapsed into that dementia so often consecutive to the graver mental maladies; the other was active-minded and despairing throughout. Both were unmarried and had followed sedentary lives. One became insane at the comparatively early age of 22; the other when advanced in life, namely, at the age of 56. Each had spent a period of about ten years in the Institution since last admission; and both were hopeless cases of mental disease.

When first admitted into the Asylum, the younger of the two was 22 years old, and had then been five weeks insane. She suffered from melancholia, and had made more than one attempt to commit suicide. She asserted that she was driven to do so in consequence of her sins, which had been so great as to preclude her from any chance of salvation. Her treatment consisted of purgatives, alteratives, and the shower-bath. Shortly after admission, she attempted

to set fire to her dress while the attendant was putting on fuel; she had gloves applied to prevent further mischief. She also refused food, and complained of an uneasy sensation in the head; on account of the latter symptom she was leeches and cupped. Though generally ill-tempered and quarrelsome, she recovered in a great measure after eight months' treatment, and was dismissed.

Twenty-two months afterwards, she was again admitted in a worse state than before, having made several attempts at suicide, the last with a penknife, with which she cut herself severely at the bend of the elbow. She endeavoured to starve herself, and required frequent use of the stomach-pump; while unwearied patience and vigilance were demanded of attendants, as she dashed herself on the floor and furniture, and attempted to throw herself down stairs. In short, she presented a complete example of an irresistible impulse to self-destruction. Nineteen months after admission, however, she was sent out cured.

The third admission was for a period of three months, about three years after the former illness, and her case had not altered. She refused food and medicine, and required artificial alimentation. In a few weeks she took her food voluntarily, and conducted herself with propriety. Another five years spent at home amidst her family (during which she swallowed many pins and needles), ended in a fourth admission, and during this stay (a space of more than two months), the features of her case, hygienic and moral, were the same as they had been on the previous occasions. A fifth and last time she was sent here on account of her unbearable temper and disposition. Silent and retiring, she took little notice of surrounding events, and kept aloof from all society. About four years afterwards, she complained of cardiac pain and debility, and was confined to bed, obstinately, however, refusing stimulants. Two years after this, her case changed for the worse, as she became violent, vituperative, and quarrelsome, and attempted to strangle herself with her pocket-handkerchief. Shortly after this outburst, she refused to walk in the grounds on account of weakness in her limbs, and never again left the building. Formerly she was stout and florid, now she had become attenuated and anæmic. Her bodily ailments were slight, consisting of nervous palpitation, headaches, and dyspepsia. It is a curious circumstance that for many years before her death she refused animal food, and generally took her meals standing. For two years before her fatal illness, she walked about holding her ears, as if hearing gave pain, and this is interesting in connexion with the state of the temporal bones.

About ten years after her last admission, she became still weaker and more anæmic, and in January last complained of severe pains in her limbs, and inability to progress, and frequently screamed out if they were interfered with. Abstinent and vegetarian as before, it was only with great pressing that she took a little arrowroot and wine. Her circulation was feeble, and her attenuated limbs quite

livid, but nothing peculiar was detected in the extremities at this time. She rallied in a few weeks, and went about as usual till the beginning of May, when increasing feebleness and prostration again obliged her to remain in bed. The pains in her arms, clavicles, and legs, were excessive, and she frequently told me they were broken or dislocated, yet no such lesion was discoverable on careful examination, though the superior extremities usually hung in a half-powerless condition. Abscesses formed at the root of the neck, exposing the clavicular origin of the sterno-cleido-mastoid, and contained greenish unhealthy pus. Acute tuberculosis now set in, and she sank in about three weeks. Her urine before death was loaded with crystals of the triple phosphate, but was not albuminous.

Such having been the history, I found at the post-mortem examination a peculiar dark red appearance of the frontal, sphenoid, parietal, and occipital bones at the base of the cranium, which led me to examine them more minutely. On slight pressure, the forceps sank into the body of the sphenoid, and from the wounds there spirted a brownish oily fluid. The petrous portion of the temporal bone, usually so dense and resisting, was in the same condition, for the bone-forceps indented it with ease, causing the same oily fluid to exude. On opening the chest, the sternum and ribs were characteristically affected; the former could be quite readily doubled up, while a very slight force caused the ribs to yield and break in any direction. The form of the chest, after removal of the sternum and thoracic contents, was diagnostic, for, instead of the ribs forming a resisting and elastic arch, the sternal ends fell towards the vertebral column by several inches. By putting one hand on the inner surface of the ribs and the other on the outer, a whole series of the bones could be broken at once. In sawing the vertebral arches, to lay bare the spinal cord, the instrument sank through the bones without much effort, the same dark oily fluid exuding. The bodies of the vertebræ were in a like condition. On cutting down to the femur in the popliteal space, I found that, on perforating the abnormally softened bone, the reddish-brown oily fluid welled out in abundance. Lest the entire bone might not be in a similar condition, another incision bared the centre of its shaft anteriorly, when the state of matters was not different, allowing, of course, for the denser nature of the bone at that part. The humerus was affected both in its shaft and head, and likewise the clavicle. In all these bones she had, as before-mentioned, felt great pain.

The general results of the post-mortem examination were included in the last annual report of the Institution (1861, p. 39, et seq.), but I may note them here more minutely for the sake of coherence and comparison. The brain was quite healthy, the only points worthy of note being the larger size of the right hemisphere posteriorly, both as regards depth and prolongation backwards, and the presence of some polypoid granulations on the choroid plexus of each lateral ventricle. The heart was small and firm, and its

valves competent. While washing the right ventricle, I was surprised to see a rounded white body floating out. Further examination showed a great number of whitish-yellow isolated masses, which lodged in the pits between the columnæ carneæ, especially towards the apex. They varied from the size of a small pea to that of a field-bean. They proved to be cysts, and contained a yellowish fluid resembling pus; but the microscope showed no pus-cells proper, only granular matter, oil-globules, and yellowish or brownish colouring matter. They appeared to be degenerated fibrinous clots. These were described as "so-called cardiac polypi" in the annual report, but they were the "purulent cysts" of Dr Stokes and others. The patient's chest had been frequently examined during life; and the only abnormal heart sound detected was a running together of the first and second sounds from want of a sufficient pause. In connexion with the diseased state of the osseous system as well as that of the lungs, for both lungs were tubercular, this state of the heart illustrates the following remark of Dr Stokes:—"It is found that, in certain cases which are examples of acute or chronic disease of organs and structures often remote from the heart, the cavities of this organ present cysts, as it were entangled in its fleshy columns, and exhibiting various degrees of adhesion to its walls."¹ The connexion between the mollities ossium and the cysts seems to be somewhat obscure, but it is worthy of note that the latter likewise contained fatty globules in their interior. Both lungs were freckled with miliary tubercles, exhibited pleuritic adhesions (the right being everywhere adherent), and in the apex of the left was a cavity containing a grumous fluid, marked externally by an old cicatrix. Some authors consider that the cardiac cysts are somehow connected with the pyogenic state, and Forget found that the confinement of the disease to the left ventricle in his case was coincident with the limitation of tubercular ulcerations to the left lung. Stokes mentions other cases in which disease of both lungs accompanied cysts in both cavities.

The liver was enlarged, pale, and fatty. A needle was found in the pancreas, and two in the omentum, about an inch and a half from the transverse sweep of the colon. They had evidently pierced the gut here, as the colon had two dark discolorations, corresponding with the situation of the needles. The latter, though eroded, retained as much of their original nature as to show head, shaft, and point. The kidneys were pale and fatty, with the cortical substance diminished, and marked off from the medullary by a dark red line. The legs had been dropsical for some time before death, but the urine was not albuminous at the periods when it was examined.

In this, as in most other cases recorded, the patient was past the middle period of life, and of the sex most usually attacked. She was of slight build and nervous diathesis, and by no means predis-

¹ Stokes on the Heart, p. 119.

posed by constitution to fatty degeneration; indeed, her subcutaneous textures were devoid of adipose matter. She suffered great pain before death from the state of her osseous system, though this was then referred to rheumatic origin, and her wailings always finished with the same desire, viz., that she might speedily be liberated by death. Her power of moving the arms and legs was throughout greatly diminished, though this might partly have arisen from pain. There was no morbid craving for a particular kind of food; on the contrary, the appetite was rather feeble, and there was a tendency to abstinence. The exclusion of animal food from her diet was voluntary, and for many years before her death she must have been nearly a pure vegetarian.

The interior of most of the bones being filled with a fatty and histolytic mass of a deep reddish colour, the skeleton, and with it the locomotive organs, must have depended solely on the exterior of the bone for support and leverage,—a support, it may be remarked, of the most inadequate kind; and had she been subjected to the vicissitudes of ordinary life, instead of being carefully superintended in a quiet and level gallery, I have no doubt that the condition of the bones would have been diagnosed long before her death by the occurrence of one or more fractures. The disease in this case must have been of slow growth; for the pains she complained of in her limbs, and her inability to walk round the grounds four years before her death, make it probable that the malady had then made considerable progress. As might be supposed, and as has generally been found, the less dense interior, beginning with the medullary membrane and medulla in the long bones, and the cancellated portion or *diplœ* in the flat and irregular bones, became affected first. In all the specimens of bones examined, the exterior was more or less deteriorated and soft, as well as abnormally dark. If she had lived longer, it is not unlikely that the osseous framework would have been transformed into mere fibrous cylinders or sacs, enclosing an oleaginous substance.

With regard to the connexion of this dyscrasia with the cerebral affection, it is possible that the same state of the system which produced the one might produce the other, but no appreciable alteration in the structure of the brain-substance was discoverable either by the scalpel or the microscope.

The other case occurred likewise in a female affected with melancholia, which had lapsed into dementia. Her mental disease was stated to have arisen from fright and bad health, at the age of fifty-six. She was treated with alteratives, purgatives, opiates, and generous diet, and in about three months left the asylum cured. She was again, however, admitted in about three months, labouring under the same delusions, declaring that her head was quite “empty,” and that she was “nobody.” A tendency to suicide was also observed. She was mentally dull and torpid, dirty and degraded in her habits. She sometimes refused food for a meal or two, but never to such an

extent as to necessitate artificial feeding. She evinced great disinclination on all occasions to enter a bath. For more than a year she had been unusually torpid and disinclined for exercise, especially that of going up stairs. Up to a month before her death, she took exercise in the airing court, and occasionally made one of walking parties beyond the barrier. Her torpidity and disinclination to exert herself was generally attributed to laziness. About this time she complained much of severe pain in the region of the hip-joints, and screamed out if hurried in walking. When her chest was examined, she complained of the pressure of the stethoscope. Latterly, she could not progress any distance without getting on her hands and knees, and generally remained quietly on her seat. She beseeched every one to let her alone, persisting at the same time that she was "nobody" and "nothing." Her tongue was foul, and her breath very offensive; she had gentle laxatives and alteratives, with suitable stimulation. The former caused her great pain, so much so, that she almost refused to take wine or porter lest they should contain medicine. She sank rapidly, delirium with tossing of the arms supervening some hours before death.

Of the post-mortem examination I shall first narrate those points connected with the morbid condition of the osseous system, together with the microscopic anatomy of certain of the bones, and then state briefly other points of interest in the case.

The bones of the cranium presented no signs of *mollities ossium*. On examining the fluid of the lateral ventricles and cavity of the skull two days after the sectio, I found its surface coated with beautiful crystals of the triple phosphate, while the field generally presented a granular aspect, with blood-corpuscles and oil-globules dispersed here and there. This is a circumstance of importance in the pathology of the disease, the usual channel for the elimination of excessive phosphates being the urine. While opening the chest, the ribs yielded and broke on the slightest interference, the fractured surfaces giving out a thin fatty fluid of a dark red colour. The chest also assumed that flattened form mentioned in the previous case. Many ribs had more or less developed callus portions, showing that lesion of the bony walls had occurred on former occasions. Other ribs had lost most of their osseous characters for a considerable distance, and were mere bands of a fibrous substance, like wet leather. The costal cartilages were much denser and stronger than these portions, and the mechanism of respiration must have been greatly interfered with. The difference between the osseous portions and the normal state of the bones was well marked. The smooth, firm, and elastic nature of the healthy rib is well known. The ribs in question were greasy, rough, and readily bent or broken in any direction, frequently splitting at the groove in their inferior border. The outer table of the bone could easily be pushed with the thumb into the cancellous portions, or at least into where that ought to have been, for in most parts it was totally gone; its place

being supplied by the fatty fluid, which readily welled out at any aperture. The costal cartilages were, in the best marked cases, altered in structure, and running laterally without interruption to a much greater extent than usual, or rather the osseous arch had also become quite degenerated in its neighbourhood, rendering the line of demarcation indistinct. When the periosteum was peeled off the edge of the degenerating bone next the softened portions, the surface was seen to be pitted with numerous large apertures, as if the osseous texture around the canals of the nutrient vessels had been the first to give way. On making a section of the portions next the costal cartilages, the incision could be carried back—even through what seemed osseous substance, so thin were the tables and so scanty the earthy matter. Isolated portions of bone mixed with the fibrous stroma, marked the gradual dissolution of the texture. Microscopically, this part presented an interesting appearance, since in the sections many small osseous nodules of degenerating bone were included. The general field was fibro-cellular, the cells being of various shapes and sizes, nucleated and often elliptical. Amongst these and the fibres were various granules and globules of oil, and, indeed, the fatty element was in great abundance,—the globules floating here and there and coalescing with one another as they met. The osseous portions were conspicuous on account of their different refracting power and structure.

Most authorities agree that the bones affected with this disease have their lacunæ enlarged. The microscopic appearance of the isolated nodules and scales of bone from the softened and fibrous regions of the ribs was interesting. Scarcely a normal lacuna could be seen, all bearing resemblance to such being altered and rounded, with only a trace of short canaliculi. These canaliculi had disappeared altogether for some portion, as the bone cell though widened could not have obliterated nearly so much. From these specimens, it would seem that the change of structure takes place, not in the bone lacunæ only, nor in the surrounding matrix only, but in both,—a fact supported by other evidence, since the whole surrounding texture is altered in such well-marked examples, and presents dark markings and a dingy granular aspect where no lacunæ ever existed. In such portions the structure is remarkable, for the field is covered with irregular dark streaks, often of large size, which are apparently cavities filled with oil. One may observe various stages in the formation of these darkened portions:—1st, The lacuna nearly of its normal form with long canaliculi; 2d, The rounded or irregular lacuna with very short canaliculi; 3d, The latter meeting with one or several of its neighbours in a like condition forms irregular islands, each connected to the other at first by a narrow isthmus, and finally merging into extensive darkened masses. But all this seems to be favoured by the altered molecular state of the surrounding matrix, which the disappearance of part of the canaliculi with other things plainly shows to be

changed. The figures given by Mr Dalrymple,¹ of bone-corpuscles altered by mollities ossium, appear to me only to be intermediate forms, though characteristic enough, the more advanced condition being seen in the irregular dark masses formed by the running together of several, as observed in the isolated nodules and scales from the soft or fibrous parts. It would not seem to be necessary for the destruction of the bone that such extreme changes of the lacunæ should ensue; but the fact of the surrounding matrix being disintegrated, likewise accounts for those cases in which the bone disappears—its canaliculi having advanced no further than the stage of shortening, and the form of the lacuna only large and rounded.

A careful microscopic investigation of various parts of these ribs showed that the lacunæ in the diseased external tables were on the whole of a wider form, sometimes were circular; and this occurs especially at the disintegrating margins. Away from the softened portions, the lacunæ and canaliculi at the exterior of the bone were little altered; but it must be remembered that the disease was only progressing, and judging from the aspect of those in the isolated portions above-mentioned, the enlargement would seem to be a mere matter of time.² Further, in a longitudinal section of some of the diseased bones close to the softened margin, the disintegration appeared to attack certain portions of the bones sooner than others, causing longitudinal streaks, whereof the lacunæ and canaliculi of the denser and more normal portions to a great extent resembled healthy bone, while the other portions showed wider and diseased lacunæ. It might be observed that the Haversian canals most frequently traversed the latter portions. The margins of the apertures on the surface of the ribs near the softened portions, which gave entrance to processes of periosteum, had a rugged granular aspect, and molecular disintegration seemed at work there with especial vigour.

The interior of the bone differed as widely as possible from that of a normal one. In an ordinary rib, the central portion is filled up by a complete network of bone, enclosing certain soft matters. If we attempt to take a portion of the latter for microscopic examination, the knife is constantly interrupted by the bony structure, and the little soft material that is got, generally contains fragments of the broken-up cancellated texture. It presents innumerable nucleated cells, generally of a circular form, and varying in size, occasionally some minute needle-shaped crystals, a few blood-discs, granular matter, and a moderate amount of oil-globules, which do not tend to run together, and seldom form large masses.

¹ Dublin Med. Trans., vol. ii.

² In preparing a section of the bone for microscopic purposes, we are apt to remove that surface most affected by the disease in grinding, and thus show its effects in a modified form. Thin plates, however, occasionally occurred in the interior or cancellated portion, which were so attenuated as to permit their subjection to the microscope without further alteration.

This description applies to a rib kept under the same circumstances as those in the case of mollities, viz., cut from the fresh subject and preserved in spirit. In the bone afflicted with mollities the state of matters is altered; for, on introducing the blade of the forceps, or other such body, at a transverse section of a rib, it could be pushed into the interior without meeting any osseous obstruction. When the outer table was removed, or a section of the bone made, its interior presented a mass of soft matter which could easily be pulled out, leaving a sharp and slender process of bone here and there to break the smooth bony tunnel. Many of these well merited the name of "threads" given to them by Dalrymple. Most of the enclosed soft material spirted out in the fresh bone, but after immersion in spirits, it became more consistent. The microscopic aspect of the bone contents showed a much greater amount of granular matter than in the healthy bone, irregularity in the shape of the nucleated cells, which sometimes were elongated, numerous blood-corpuscles, and an enormous preponderance of fatty masses and globules. At the tougher portions, a considerable amount of fibrous texture was likewise present.

The ribs were also interesting in having certain callus formations, the result of frequent fractures. One was especially diagnostic, since only the anterior table of the bone had given way, leaving the pleural surface entire. On raising the outer table at this part, a tough fibrous provisional callus filled the whole interior of the bone for fully half an inch on each side of the depression. It was arranged in layers like bands of muscle. The callus formed at certain parts seemed quite in accordance with the formation of such in a healthy person, only the dense or parietal portion of the bone was thinned, though sometimes forming the strongest part of these weak bones. In other cases degeneration had followed, and softened pulp obliterated the callus internally, before the outer portion had become sufficiently consolidated. The microscopic examination of the callus portions showed the usual structure, with the addition of an enormous quantity of fatty particles.

The prolongation of a tough and somewhat resisting fibrous band from the costal cartilages seemed to be a special provision of nature for the safety—functional and organic—of the thoracic contents.

The other bones affected were the bodies and arches of the vertebræ,—cervical, dorsal, and lumbar. The sacrum and adjoining portions of the ossa innominata were much softened; and it will be remembered that she complained of constant pain in those parts, aggravated by walking. I cut down on the head of the humerus, the distal end of the radius, the hip-joint, and the lower end of the femur, but in none of these did there appear to be mollities.

As regards the other pathological appearances, it may be briefly stated that the brain was quite healthy, with the exception of a small fibrous tumour, about the size of a pea, on the choroid plexus of each lateral ventricle; heart, soft and fatty; liver, enlarged, fatty, and

dotted with numerous dense fibrous masses of a circular form. Œsophagus inflamed throughout almost its entire length (she had much difficulty and pain in swallowing for some days before death). The capsules of the kidneys adherent, and their texture fatty, containing in the pelves casts with abundant oil-globules. The right kidney was most affected, its cones and cortical substance being nearly indistinguishable, except at the lower end. The omentum and abdominal textures generally contained much fat, as also did the subcutaneous tissues throughout. There was a fibrous tumour as large as a hen's egg in the left mamma, and several smaller ones of the same nature in the fundus and cervix of the uterus. There was only a trace of atheroma at the bifurcation of the aorta.

The leading features of the two foregoing cases were the following:—Both patients laboured under a depressing mental affection, and one superadded the exhaustion of partial—sometimes complete—abstinence. Both complained of great pain in the bones affected, had fatty disease of the kidneys, and a morbid condition of the liver. In the one, abundant crystals of the triple phosphate were found in the urine; in the other, no urine could be collected either before or after death, but the crystals were numerous in the fluids of the encephalon. In the younger the frame was emaciated in the extreme, and the lungs very tubercular; in the other, there was abundance of adipose matter and no tubercles.

The exact origin of the malady in the two foregoing cases is not very apparent, though both show certain features which have been stated as causes. The sedentary life under the depressing mental infirmity, and the confinement, however modified, continued over a series of years, give us strongly marked elements of the causation generally stated. I do not think that asylum life produced the disease, but certainly it would aggravate the tendency. The abstinence of the younger seems to have especially favoured the progress of the malady.

